

II. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. DESCRIPTION OF GOOSE MANAGEMENT TECHNIQUES

The selection and successful implementation of an effective goose damage management strategy depends on many factors. The time of year, the geographic characteristics of the site, the cost-effectiveness of techniques, laws and regulations, and public acceptance are just a few of the factors affecting the overall success of any damage management program. Thus, before any management is undertaken, the responsible parties, regardless of whether they are a Federal, State, or local agency, or a private individual, must consider and weigh each of these factors.

Wildlife Services is the Federal agency with authority for dealing with wildlife damage complaints. As such, their expertise in wildlife damage management assessment and resolution is recognized by most wildlife professionals. Generally, the most effective approach to resolving wildlife damage problems is to utilize several methods, either simultaneously or sequentially. Wildlife Services's Integrated Wildlife Damage Management (IWDM) integrates and applies practical and proven methods of prevention and reduction of wildlife damage while minimizing negative impacts on humans, other species, and the environment. IWDM incorporates consideration of resource management, physical exclusion and deterrents, and localized population management, or any combination of these, depending on the characteristics of specific damage problems.

In selecting management techniques for specific damage situations, consideration is given to the responsible wildlife species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage or conflict. Consideration is also given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects, and relative costs of damage-reduction options. The cost of damage reduction may sometimes be a secondary concern because of the overriding environmental, legal, and animal-welfare considerations.

A variety of methods are potentially available regarding the management of damage from resident Canada geese. Wildlife Services develops and recommends or implements IWDM strategies based on resource management, physical exclusion and wildlife management approaches. Within each approach there may be available a number of specific methods or tactics.

Various Federal, State, and local statutes and regulations and Wildlife Services directives govern Wildlife Services use of damage management tools. The following methods and materials are considered, recommended or used in technical assistance and direct damage management efforts of the Wildlife Services program. A more detailed discussion of most of these techniques is contained in Smith et al. (1999).

1. Resource Management

Resource management includes a variety of practices that may be used by resource owners to reduce the potential for wildlife damage. Implementation of these practices is appropriate when the potential for damage can be reduced without significantly increasing a resource owner's costs or diminishing his/her ability to manage resources pursuant to goals. Resource management recommendations are made through Wildlife Services technical assistance efforts.

Habitat Alteration: Habitat alteration can be the planting of vegetation unpalatable to wildlife or altering the physical habitat (Conover and Kania 1991, Conover 1992). Conover (1991a, 1991b) found that even hungry Canada geese refused to eat some ground covers such as common periwinkle (*Vinca minor*), English ivy (*Hedera helix*) and Japanese pachysandra (*Pachysandra terminalis*). Planting less preferred plants or grasses to discourage geese from a specific area could work more effectively if good alternative feeding sites are nearby (Conover 1985). However, the manipulation of turf grass varieties in urban/suburban, heavy use situations such as parks, athletic fields and golf courses is often not feasible.

Fences, hedges, shrubs, boulders, etc. can be placed at shorelines to impede goose movements. Restricting a goose's ability to move between water and land will deter geese from an area, especially during molts (Gosser et al. 1997). However, people are often reluctant to make appropriate landscape modifications to discourage goose activity (Breault and McKelvey 1991, Conover and Kania 1991). Both humans and geese appear to find lawn areas near water attractive (Addison and Amernic 1983, Cooper^a In Press), and conflicts between humans and geese likely will continue wherever this interface occurs.

Removal of water bodies would likely reduce the attractiveness of an area to waterfowl. Urban/suburban Canada geese tend to feed near bodies of water with good visibility over short grass (Conover and Kania 1991). Draining/removal of water bodies is considered unreasonable and aesthetically unacceptable. The draining of wetlands is strictly regulated and must be permitted by the U.S. Army Corps of Engineers and some State agencies.

Lure Crops: Lure crops are food resources planted to attract wildlife away from more valuable resources (e.g., agricultural crops). This method is largely ineffective for urban resident Canada geese since food resources (turf) are readily available in urban landscapes. For lure crops to be effective, the ability to keep birds from surrounding habitats and fields would be necessary, and the number of alternative feeding sites must be minimal (Fairaizl and Pfeifer 1988). Additionally, lure crops reduce damage for only discrete periods of time (Fairaizl and Pfeifer 1988) and potential damage by resident Canada geese is generally throughout the year. Furthermore, the resource owner is limited in implementing this method contingent upon ownership of, or otherwise ability to manage the property. Finally, unless the original waterfowl-human conflict is resolved, creation of additional waterfowl habitat could increase future conflicts in the long-term.

Modify Human Behavior: Food provided by people attracts and sustains more waterfowl in an area than could be supported by natural food supplies. This unnatural food source exacerbates damage by resident geese and should be eliminated. The elimination of feeding of waterfowl is a primary recommendation made by Wildlife Services, the Service, and State wildlife agencies, and many local municipalities have adopted policies prohibiting it. Some parks have posted signs, and there have been efforts made to educate the public on the negative aspects of feeding waterfowl. However, many people do not comply, and the policies are poorly enforced in some areas.

Alternatively, some entities encourage/permit the feeding of geese because the goose population in the location has not exceeded their wildlife acceptance capacity. It is unlikely that the feeding of geese in these locations would significantly contribute to conflicts with geese in other communities or locations.

Alter Aircraft Flight Patterns: In cases where the presence of waterfowl at airports results in threats to air traveler safety and when such problems cannot be resolved by other means, the alteration of aircraft

flight patterns or schedules may be recommended. However, altering standard operations at airports to decrease the potential for hazards is not feasible unless an emergency situation exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

Removal of Domestic Waterfowl: Flocks of urban waterfowl are known to act as “decoys” and attract migrating waterfowl (Crisley et al. 1968, Woronecki 1992, AAWV undated). Rabenold (1987) and Avery (1994) reported that birds learn to locate food resources by watching the behavior of other birds. The removal of domestic waterfowl from ponds removes birds that act as “decoys” in attracting Canada geese. Domestic and feral geese could also carry diseases which threaten wild populations (AAWV undated). Resource owners may be reluctant to remove some or all decoy birds because of the enjoyment of their presence.

2. Physical Exclusion and Deterrents

Physical exclusion and deterrents restrict the access of wildlife to resources and/or alter behavior of target animals to reduce damage. These methods provide a means of appropriate and effective prevention of resident Canada goose damage in many situations. No Federal migratory bird permits are needed for nonlethal aggressive harassment activities to harass geese out of an area. However, we note that some States have regulations which prohibit harassment of geese and other wildlife.

Electric Fence: The application of electrified fencing is generally limited to rural settings due to possible accidental interactions with people and pets. This practice has been used to keep geese enclosed within wetland complexes, and to exclude them from adjacent agricultural fields susceptible to goose damage during certain times of the year. The efficiency of electrical fencing can vary with the number of multiple landowners along the wetland, and the size of the agricultural field and its proximity to wetlands inhabited by resident geese. While electric fencing may be effective in repelling geese in some urban settings, its use can be prohibited in municipalities for human safety reasons. Problems that typically reduce the effectiveness of electric fences include; vegetation on fence, flight capable geese, fencing knocked down by other animals (e.g., white-tailed deer and dogs), time of year (seasonally effective) and inadequate electrical power.

Barrier Fence: The construction or placement of physical barriers has limited application for resident geese. Barriers can be temporary or permanent structures. Lawn furniture/ornaments, vehicles, boats, snow fencing, plastic hazard fencing, metal wire fencing, and multiple strand fencing have all been used to limit the movement of resident geese. Reports from cases in Minnesota indicate that permanent barriers were perceived to be highly effective, while temporary barriers were moderately effective (Cooper and Keefe 1997). The application of this method is limited to areas that can be completely enclosed and do not allow geese to land inside enclosures. Similar to most abatement techniques, this method has been most effective when dealing with small numbers of breeding geese and their flightless goslings along wetlands and/or waterways. Unfortunately, there have been situations where barrier fencing designed to inhibit goose nesting has entrapped goslings and resulted in starvation (Cooper 1998).

The preference for geese to walk or swim, rather than fly, during brood raising and molting contributes to the success of barrier fences. Geese that are capable of full or partial flight render this method useless, except for enclosed areas small enough to prevent landing. However, site-specific habitat alterations have merit, provided that landscape designs are based on biological diversity and human safety

objectives (Cooper, In Press).

Surface Coverings: Canada geese may be excluded from ponds using overhead wire grids (Fairaizl 1992, Lowney 1993). Overhead wire grids have been demonstrated to be most applicable on ponds \leq two acres, but wire grids may be considered unsightly or aesthetically unappealing to some people. Wire grids render a pond unusable for boating, swimming, fishing, and other recreational activities. Installation costs are about \$1,000 per surface acre for materials. The expense of maintaining wire grids may be prohibitive for some people.

Floating plastic balls approximately five inches in diameter can be used to cover the surface of a pond. A “ball blanket” renders a pond unusable for boating, swimming, fishing, and other recreational activities. This method is very expensive, costing about \$131,000 per surface acre of water.

Visual Deterrents: Reflective tape has been used successfully to repel some birds from crops when spaced at three to five meter intervals (Bruggers et al. 1986, Dolbeer et al. 1986). Mylar flagging has been reported effective at reducing migrant Canada goose damage to crops (Heinrich and Craven 1990). Conversely, other studies have shown reflective tape ineffective (Tobin et al. 1988, Bruggers et al. 1986, Dolbeer et al. 1986, Conover and Dolbeer 1989). While sometimes effective for short periods of time, reflective tape has proven mostly ineffective in deterring resident geese. Flagging is impractical in many locations and has met with some local resistance due to the negative aesthetic appearance presented on the properties where it is used.

Mason et al. (1993) and Mason and Clark (1994) have shown white and black plastic flags to be effective at repelling snow geese from pastures when alternative grazing areas were available. However, some farmers in Wisconsin have reported that black plastic flags can actually attract geese to a location (R. Christian, Wisconsin APHIS/WS, April, 2000, pers. comm. as cited in USDA 2000).

Mute Swans: Mute swans are ineffective at preventing Canada geese from using or nesting on ponds (Conover and Kania 1994). Additionally, swans can be aggressive towards humans (Conover and Kania 1994, Chasko 1986) and may have undesirable effects on native aquatic vegetation (Allin et al. 1987, Chasko 1986). Furthermore, Executive Order 11987 May 24, 1977, states that federal agencies shall encourage states, local governments, and private citizens to prevent the introduction of exotic species into the environment. Mute swans are classified as an exotic species.

Dogs: Dogs can be effective at harassing geese and keeping them off turf and beaches (Conover and Chasko 1985, Woodruff and Green 1995). Around water, this technique appears most effective when the body of water to be patrolled is less than two acres in size (Swift 1998). Although dogs can be effective in keeping geese off individual properties, they do not contribute to a solution for the larger problem of overabundant goose populations (Castelli and Sleggs 1998). Swift (1998) reported that when harassment with dogs ceases, the number of geese return to pre-treatment numbers. Wildlife Services has recommended and encouraged the use of dogs where appropriate. Permits may be required.

Repellents: Methyl anthranilate (MA) is a registered repellent for Canada geese marketed under the trade names ReJeX-iT and Bird Shield. Results with MA appear mixed. Cummings et al. (1995) reported that MA repelled Canada geese from grazing turf for four days. However, Belant et al. (1996) found it ineffective as a grazing repellent when applied at 22.6 and 67.8 kg/ha which is the label rate and triple the label rate, respectively. MA is water soluble, therefore moderate to heavy rain or daily

watering and/or mowing render MA ineffective. Permits may be required to use chemical repellents for goose damage management in some States.

Research continues on other avian feeding repellents. A 50% anthraquinone product (FlightControl), shows promise for Canada geese (Dolbeer et al. 1998). Like MA, anthraquinone has low toxicity to birds and mammals. Activated charcoal has also been evaluated for use in deterring goose damage, but it requires frequent re-application to be effective (Mason and Clark 1995). Further, laboratory and field trials are needed to refine minimum repellent levels and to enhance retention of treated vegetation (Sinnott 1998).

Hazing: Hazing reduces losses in those instances when the affected geese relocate to a more acceptable area. Achieving that end has become more difficult as local goose populations have increased. Birds hazed from one area where they are causing damage, frequently move to another area where they cause damage (Brough 1969, Conover 1984, Summers 1985, Swift 1998). Smith et al. (1999) noted that others have reported similar results, stating: "...biologists are finding that some techniques (e.g., habitat modifications or scare devices) that were effective for low to moderate population levels tend to fail as flock sizes increase and geese become more accustomed to human activity". In most instances, birds tend to habituate to hazing techniques (Zucchi and Bergman 1975, Blokpoel 1976, Summers 1985, Aubin 1990).

Scarecrows: The use of scarecrows has had mixed results. Effigies depicting alligators, humans, floating swans and dead geese have been employed, with limited success for short time periods in small areas. An integrated approach (swan and predator effigies, distress calls and non-lethal chemical repellents) was found to be ineffective at scaring or repelling nuisance Canada geese (Conover and Chasko 1985). While Heinrich and Craven (1990) reported that using scarecrows reduced migrant Canada goose use of agricultural fields in rural areas, their effectiveness in scaring geese from suburban/urban areas is severely limited because resident geese are not afraid of humans as a result of nearly constant contact with people. In general, scarecrows are most effective when they are moved frequently, alternated with other methods, and are well maintained. However, scarecrows tend to lose effectiveness over time and become less effective as goose populations increase (Smith et al. 1999).

Distress Calls: Aguilera et al. (1991) found distress calls ineffective in causing either migratory or resident geese to abandon a pond. Although, Mott and Timbrook (1988) reported distress calls as effective at repelling resident Canada geese 100 meters from the distress unit, the geese would return shortly after the calls stopped. The repellency effect was enhanced when pyrotechnics were used with the distress calls. In some situations, the level of volume required for this method to be effective in urban/suburban areas would be prohibited by local noise ordinances. A similar device, which electronically generates sound, has proven ineffective at repelling migrant Canada geese (Heinrich and Craven 1990).

Pyrotechnics: Pyrotechnics (screamer shells, bird bombs, and 12-gauge cracker shells) have been used to repel many species of birds (Booth 1994). Aguilera et al. (1991) found 15mm screamer shells effective at reducing both resident and migrant Canada geese use of areas of Colorado. However, Mott and Timbrook (1988) and Aguilera et al. (1991) doubted the efficacy of harassment and believed that moving the geese simply redistributed the problem to other locations.

Fairaizl (1992) and Conomy et al. (1998) found the effectiveness of pyrotechnics highly variable among

flocks of waterfowl. Some flocks in urban areas required continuous day long harassment with frequent discharges of pyrotechnics. The geese usually returned within hours. A minority of resident Canada goose flocks in Virginia showed no response to pyrotechnics (Fairaizl 1992). Some flocks of Canada geese in Virginia have shown quick response to pyrotechnics during winter months, suggesting that migrant geese made up some or all of the flock (Fairaizl 1992). Shultz et al. (1988) reported fidelity of resident Canada geese to feeding and resting areas is strong, even when heavy hunting pressure is ongoing. Mott and Timbrook (1988) concluded that the efficacy of harassment with pyrotechnics is partially dependent on availability of alternative loafing and feeding areas. Although one of the more effective methods of frightening geese away, more often than not they simply move geese to other areas. There are also safety and legal implications regarding their use. Discharge of pyrotechnics is inappropriate and prohibited in some urban/suburban areas. Pyrotechnic projectiles can start fires, ricochet off buildings, pose traffic hazards, trigger dogs to bark incessantly, and annoy and possibly injure people.

Propane Cannons: Propane cannons are generally inappropriate for urban/suburban areas due to the repeated loud explosions, which many people would consider a serious and unacceptable nuisance. Although a propane cannon can be an effective dispersal tool for migrant geese in agricultural settings, resident geese in urban areas are more tolerant of noise and habituate to propane cannons in a relatively short period of time.

3. Population Management

Methods of managing the local population density include relocation, contraception, egg destruction, capture with oral hypnotics, toxicants, hunting, depredation permits, capture and process for human consumption.

Relocation: Relocating Canada geese can have mixed results. Cooper and Keefe (1997) found the rate of return of relocated geese to the capture sites was lowest for immatures and highest for adults. They reported 0–4 percent of relocated juveniles returned to capture sites and 42 - 80 percent of relocated adults returned to capture sites. Fairaizl (1992) found 19 percent of relocated juveniles returned to the capture area. Smith (1996) reported that the relocation of groups of juvenile geese from urban to rural settings can effectively eliminate geese from urban areas, help retain geese at the release site, expose them to the sport harvest, and increase the natural mortality. Smith (1996) also reported that multiple survival models indicated that survival estimates of relocated juveniles were half of those of urban captured and released birds.

Ultimately, the relocation of resident Canada geese from urban habitats can assist in the reduction of overabundant populations (Cooper and Keefe 1997), and has been accepted by the general public as a method of reducing goose populations to socially acceptable levels (Fairaizl 1992). In addition, the removal of geese posing or likely to pose a hazard to air safety at airports has been demonstrated to reduce the population of local geese and decrease the number of goose flights through the airport operations airspace, and has resulted in increased air safety at the Minneapolis-St. Paul International Airport (Cooper 1991).

Relocation of resident geese has the potential to spread disease into populations of other waterfowl, including migrants. The AAWV (undated) “..discourages the practice of relocating nuisance or excess urban ducks, geese and swans to other parks or wildlife areas as a means of local population control.”

The Wisconsin Department of Natural Resources contacted wildlife management agencies of 49 States (excluding Hawaii) to determine if they were interested in obtaining resident Canada geese from Wisconsin. Responses indicated that no States were willing to accept geese from Wisconsin (J. Bergquist, personal communication as cited in USDA 2000). The Wisconsin Department of Natural Resources determined that a limited number of juvenile resident Canada geese may be relocated to designated sites within the state. The relocations would not be a population restoration effort, but rather would be allowed to alleviate nuisance situations and to provide additional hunting opportunities in the release areas.

Contraception: Contraceptives have not proven to be an effective long-term solution to controlling populations and reducing damage, and there are no contraceptive drugs registered with the FDA for Canada geese. Although Canada geese have been successfully vasectomized to reduce or prevent gosling production, this method can only prevent the production by a mated pair and is ineffective if the female forms a bond with a different male. In addition, the ability to identify breeding pairs for isolation and to capture a male goose for vasectomization becomes increasingly difficult as the number of geese increases (Converse and Kennelly 1994). Canada geese have a long life span once they survive their first year (Cramp and Simmons 1977, Allan et al. 1995); leg-band recovery data indicate that some geese live longer than 20 years. Thus, the sterilization of resident Canada geese would not reduce the damage caused by the current overabundance of the goose population since the population of Canada geese would remain relatively stable. Keefe (1996) estimated sterilization to cost over \$100 per goose (see section **II.D.1. Use of Birth Control** for further discussion).

Egg Destruction: Addling, oiling, freezing, replacement, or puncturing of eggs can be effective in reducing annual recruitment into the local population (Christens et al. 1995, Cummings et al. 1997). While egg removal/destruction can reduce production of goslings, merely destroying an egg does not reduce a population as quickly as removing immature or breeding adults (Cooper and Keefe 1997). As with other species of long-lived geese, which require high adult mortality to reduce populations (Rockwell et al. 1997), it is likely that adult resident Canada geese must be removed to reduce the population to a level deemed acceptable to communities. Approximately five eggs must be removed to have the effect of preventing one adult from joining the breeding population (Rockwell et al. 1997, Schmutz et al. 1997). Keefe (1996) estimated egg destruction to cost \$40 for the equivalent of removing one adult goose from the population. In addition, nest destruction is estimated to cost significantly more than other forms of population management (Cooper and Keefe 1997). Egg destruction, while a valuable tool, has fallen short as a single method for reducing local goose populations. Many nests cannot be found by resource managers in typical urban settings due to the difficulties in gaining access to search the hundreds of private properties where nests may occur. In addition, geese which have eggs oiled in successive years may learn to nest away from the water making it more difficult to find nests. Furthermore, any effective egg destruction program must consider possible renesting by geese within a particular year and the need for multiple years of treatment. If the eggs are destroyed improperly or too early in the breeding season, the possibility of renesting increases and implementation of a one-year or intermittent egg destruction program does little to curb population growth rates over the long-term.

Capture With Alpha Chlorolose: Alpha Chlorolose may be used only by Wildlife Services personnel to capture waterfowl. Pursuant to FDA restrictions, waterfowl captured with Alpha Chlorolose for subsequent euthanasia must be killed and buried or incinerated, or be held alive for at least 30 days, at which time the birds may be killed and processed for human consumption.

Toxicants: All pesticides are regulated by the EPA. There are currently no toxicants registered with the EPA for use on Canada geese.

Hunting and Depredation Permits: Wildlife Services sometimes recommends that resource owners consider legal hunting as an option for reducing goose damage. Although legal hunting is impractical and/or prohibited in many urban/suburban areas, it can be used to reduce some populations of resident Canada geese. Legal hunting also reinforces harassment programs (Kadlec 1968). Zielske et al. (1993) believed legal hunting would not reduce Canada goose populations where there is limited interest in hunting resident Canada geese.

Shooting: “Shooting” is the practice of selectively removing target birds by shooting with a firearm. Shooting a few individuals from a larger flock can reinforce birds’ fear of harassment techniques. Shooting is used to reduce goose problems when other lethal methods are determined to be appropriate. The birds are killed as quickly and humanely as possible.

Capture with Option to Process for Human Consumption: The most efficient way to reduce the size of an urban flock is to increase mortality among adult geese. Nationwide, hunting is the major cause of goose mortality, but in an urban environment geese may seldom be available to hunters (Conover and Chasko 1985, Smith et al. 1999). For purposes of lethal control, resident geese are usually captured with rocket nets, drive traps, net guns, dip nets, and/or by hand. Rocket netting involves the setting of bait in an area that can be completely contained within the dimensions of a fully-deployed propelled net. Rocket nets are launched too quickly for the geese to escape. Rocket netting may take place anytime during the year.

The molt process, which renders Canada geese flightless, occurs during a short period in the summer. Migrant Canada geese are not present in the conterminous U.S. during the summer months, nor do they cause many of the conflicts in urban/suburban locations. Therefore, to target resident Canada geese for human consumption, capture would be restricted to the summer period (Wildlife Services may conduct activities at any time, as appropriate). Resident Canada geese captured during this period may be processed for human consumption and donated to charitable organizations.

It is estimated to cost \$18-25 per goose for capture and processing for human consumption (Keefe 1996, Cooper and Keefe 1997). In most cases, these costs do not include the costs of holding and conditioning for processing.

The advantages of lethal damage management by Wildlife Services are that it would be applied directly to the problem population, its effects are obvious and immediate, and it carries no risk that the geese will return or move and create conflicts elsewhere. The primary disadvantage is that it is sometimes more socially controversial than other techniques. The use of lethal methods to reduce Canada goose damage can be very effective at alleviating damage and is more economical in this regard when compared to non-lethal methods (Cooper and Keefe 1997). Additionally, capture and removal of Canada geese is the most cost-effective lethal method to reduce damage, except for hunting (Cooper and Keefe 1997). Moreover, the use of lethal methods has longer effectiveness than non-lethal methods because it can take months to years before the original local population level of Canada geese returned. Lethal methods would also reduce conflict among resource owners, whereas non-lethal actions only move the Canada geese among resource owners (i.e., spread the damage) (Cooper and Keefe 1997, Smith et al. 1999), and possibly leave resource owners with the fewest financial means burdened with the Canada geese and the

damage.

B. PRINCIPAL ALTERNATIVE ACTIONS

We evaluated seven principal alternatives for strategies to control and manage resident Canada geese that either pose a threat to health and human safety or cause damage to personal and public property, agriculture, and natural resources. These alternatives were developed and further refined as a result of the public scoping process and public comments received on the draft EIS. Some of the alternatives contain some or all of the elements of other alternatives or consist of combinations of other alternatives. We note that none of these alternatives authorize any entry onto private property without permission.

Further, all resident Canada geese taken under the various alternatives, *except those taken under expanded hunting methods* (Alternative D and the conservation order provisions of Alternative F) must be properly disposed of or utilized. Canada geese killed under these alternatives may be donated to public museums or public scientific and educational institutions for exhibition, scientific, or educational purposes, or charities for human consumption. Geese may also be buried or incinerated. No Canada geese taken under these alternatives, nor their plumage, may be sold, offered for sale, bartered, or shipped for purpose of sale or barter.

1. Alternative A - No Action

Under the No Action Alternative, the status quo would be maintained. All methods of nonlethal harassment would continue to be allowed as it is currently under Federal regulations. No additional regulatory methods or strategies would be authorized. We would continue the use of special and regular hunting seasons, issued under 50 CFR §20, and the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively. Those conflicts not eligible for inclusion under the special Canada goose permit would continue to be dealt with on a case-by-case basis, requiring a separate Federal permit for every locality and occurrence within a State for implementation of any form of currently regulated management or control measure. All permits would continue to be issued by Regional Offices of the Service.

2. Alternative B - Nonlethal Control and Management (Non-permitted activities)

This is a nonlethal management alternative with no permitting. Under this alternative, the Service and Wildlife Services would actively promote (i.e., either provide staffing and/or funding) the use of non-lethal management tools, such as habitat manipulation and management and goose harassment techniques, and cease the issuance of all Federal permits for the management and control of resident Canada geese. Only those management techniques not currently requiring a Federal permit would be continued under this alternative and anyone could use these techniques where they are permitted by State law or regulation. Management activities such as trapping and relocation of geese or egg addling would not be allowed or permitted since all permit issuance would cease under this alternative, and we would not issue permits under existing regulations allowing the take of either goslings or adults. Additionally, special hunting seasons primarily directed at resident Canada geese would be discontinued. This alternative would require either the establishment of new positions, additional funding, reallocation of existing activities, or some combination of the above.

3. Alternative C - Nonlethal Control and Management (including Permitted activities)

This is a nonlethal management alternative with permitting for those activities generally considered nonlethal. Under this alternative, the Service and Wildlife Services would actively promote (i.e., either provide staffing and/or funding) the use of non-lethal management tools, such as habitat manipulation and management and goose harassment techniques and anyone could use these techniques where they are permitted by State law or regulation. Management activities such as trapping and relocation of geese or egg addling would be allowed with a Federal permit. However, we would not issue permits under existing regulations, including the Special Canada goose permit, allowing the take of either goslings or adults. Special hunting seasons primarily targeted at resident Canada geese would be continued. This alternative would require either the establishment of new positions, additional funding, reallocation of existing activities, or some combination of the above.

4. Alternative D - Expanded Hunting Methods and Opportunities

This alternative would provide new regulatory options to State wildlife management agencies and Tribal entities to potentially increase the harvest of resident Canada geese above that which results from existing special Canada goose seasons that target resident Canada geese. This approach would authorize the use of additional hunting methods such as electronic calls, unplugged shotguns, and expanded shooting hours (one-half hour after sunset). During existing, operational, special September Canada goose seasons (i.e., September 1-15), these additional hunting methods would be available for use on an operational basis. Utilization of these additional hunting methods during any new special seasons or other existing, operational special seasons (i.e., September 15-30) would be experimental and require demonstration of a minimal impact to migrant Canada goose populations. These experimental seasons would be authorized on a case-by-case basis through the normal migratory bird hunting regulatory process.

All expanded hunting methods and opportunities would be in accordance with the existing Migratory Bird Treaty frameworks for sport hunting seasons (i.e., 107 day limit from September 1 to March 10) and would be conducted outside of any other open waterfowl season (i.e., when all other waterfowl and crane hunting seasons were closed).

The alternative would be restricted to the States of Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Only State wildlife agencies and Tribal entities in these States could authorize the use of the additional hunting methods for resident Canada geese in the Atlantic, Central, and Mississippi Flyway portions of these States.

In addition, we would continue the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively. Annual spring breeding population monitoring would be used to assess population status and provide for the long-term conservation of the resource. Since Federal harvest surveys are already in place, no additional harvest reporting by the States would be required.

5. Alternative E - Control and Depredation Order Management

Under this alternative, any one or all of the strategies (Control and Depredation Orders) listed below could be implemented by the applicable party if the State elects to participate in the program (by either not imposing additional State restrictions or by assuming the responsibility as an agency). The Orders would allow management activities for resident Canada goose populations only and, as such, in order to ensure protection of migrant Canada goose populations, could only be implemented between March 1 and August 31 (in general, see each Order for further specifics on time restrictions). In addition to these specific strategies, we would continue the use of special and regular hunting seasons, issued under 50 CFR §20, and the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively. In all cases, we would continue to annually monitor the spring breeding population to assess population status and provide for the long-term conservation of the resource. Additionally, States or other applicable parties (such as airports, private landowners, or agricultural producers) would be required to either annually report or record all take of resident Canada geese.

a. Airport Control Order

This option would establish a control order authorizing airport managers at commercial, public, and private airports (airports) (and their employees or their agents) and military air operation facilities (military airfields) (and their employees or their agents) to establish and implement a resident Canada goose control and management program when necessary to protect public safety and allow resolution or prevention of airport and military airfield safety threats from resident Canada geese. Control and management activities would include indirect and/or direct control strategies such as trapping and relocation, nest and egg destruction, gosling and adult trapping and culling programs, or other control strategies. The intent of this alternative is to significantly reduce resident Canada goose populations at airports, where there is a demonstrated threat to human safety and aircraft.

To be designated as an airport that is authorized to participate in the program, an airport must be (1) part of the National Plan of Integrated Airport Systems and have received federal grant-in-aid assistance, or (2) a military airfield. The term “military airfield” means an airfield or air station that is under the jurisdiction, custody, or control of the Secretary of a military department. Only Airports and military airfields in the 48 contiguous States would be eligible to conduct and implement the various resident Canada goose control and management program components.

Airports and military airfields could conduct management and control activities, involving the take of resident Canada geese, under this section between April 1 and September 15. The destruction of resident Canada goose nests and eggs could take place between March 1 and June 30. Resident Canada geese could be taken only within a 3-mile radius of the airport or military airfield and must first obtain all necessary authorizations from landowners for all management activities conducted outside the airport or military airfield’s boundaries. Record-keeping requirements would include the maintenance of a log recording the date and number of birds killed and the number of nests and eggs taken and the submission of an annual report.

b. Nest and Egg Depredation Order

This option would establish a depredation order authorizing private landowners and managers of public

lands (landowners) (and their employees or their agents) to destroy resident Canada goose nests and take resident Canada goose eggs on property under their jurisdiction when necessary to resolve or prevent injury to people, property, agricultural crops, or other interests. The goal of this program would be to stabilize resident Canada goose breeding populations, not directly reduce populations, and thus prevent an increase in long-term conflicts between geese and people.

Landowners authorized to operate under the depredation order could conduct resident Canada goose nest and egg destruction activities between March 1 and June 30. Record-keeping requirements would include the maintenance of a log recording the date and number of nests and eggs taken and the submission of an annual report.

c. Agricultural Depredation Order

This option would establish a depredation order at agricultural facilities by authorizing States, via the State wildlife agency, to implement a program to allow landowners, operators, and tenants actively engaged in commercial agriculture (agricultural producers) (or their employees or agents) to conduct direct damage management actions such as nest and egg destruction, gosling and adult trapping and culling programs, or other wildlife-damage management strategies on resident Canada geese when the geese are committing depredations to agricultural crops and when necessary to resolve or prevent injury to agricultural crops or other agricultural interests from resident Canada geese.

The program would be restricted to the States of Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Only State wildlife agencies in these States could authorize agricultural producers to conduct and implement the various components of the depredation order for resident Canada geese at agricultural facilities in the Atlantic, Central, and Mississippi Flyway portions of these States.

Authorized agricultural producers could conduct management and control activities, involving the take of resident Canada geese, under this section between May 1 and August 31. The destruction of resident Canada goose nests and eggs could take place between March 1 and June 30.

Persons operating under the program would not be allowed to use decoys, taped calls, or other devices to lure birds. Additionally, all management actions would have to occur on the premises of the depredation area and resident Canada geese could only be taken on land which an authorized agricultural producer personally controls and where geese are committing depredations to agricultural crops.

Record-keeping requirements for the agricultural producer would include the maintenance of a log recording the date and number of nests and eggs taken. Participating States would be required to submit an annual report summarizing activities.

d. Public Health Control Order

This option would establish a control order authorizing States, via the State wildlife agency, to conduct resident Canada goose control and management activities including direct control strategies such as

trapping and relocation, nest and egg destruction, gosling and adult trapping and culling programs, or other wildlife damage-management strategies when resident Canada geese are posing a direct threat to human health. A direct threat to human health is one where a federal, state, or local public health agency recommends removal of resident Canada geese that the agency has determined pose a specific, immediate human health threat by creating conditions conducive to the transmission of human or zoonotic pathogens. The State could not use this control order for situations in which resident Canada geese were merely causing a nuisance.

Management and control activities, involving the take of resident Canada geese, could only be conducted between April 1 and August 31. The destruction of resident Canada goose nests and eggs could take place between March 1 and June 30. Resident Canada geese could be taken only within the specified area of the direct threat to human health.

Participating States would be required to submit an annual report summarizing activities.

6. Alternative F - Integrated Damage Management and Population Control (PROPOSED ACTION)

This alternative would establish a new regulation with three main program components. The first component would consist of Alternative E - Control and Depredation Order Management and would be targeted to address resident Canada goose depredation, damage, and conflict management. All components of Alternative E - Control and Depredation Order Management would be available to the applicable party if the State elects to participate in the program (by either not imposing additional State restrictions or by assuming the responsibility as an agency). See **II.B.5. Alternative E - Control and Depredation Order Management** for specifics on each order.

The second component would consist of Alternative D - Expanded Hunting Methods and Opportunities and would be targeted to increase the sport harvest of resident Canada geese above that which results from existing September special Canada goose seasons. This component would provide new regulatory options to State wildlife management agencies and Tribal entities by authorizing the use of additional hunting methods such as electronic calls, unplugged shotguns, and expanded shooting hours (one-half hour after sunset) during existing September Canada goose seasons and outside of any other open waterfowl season (i.e., when *all other waterfowl and crane hunting seasons were closed*). See **II.B.4. Alternative D - Expanded Hunting Methods and Opportunities** for specifics on the alternative.

The third component would consist of a new regulation authorizing a resident Canada goose population control program, or management take. We have defined management take as a special management action that is needed to reduce certain wildlife populations when traditional management programs are unsuccessful in preventing overabundance of the population. The management take program would be implemented under the authority of the Migratory Bird Treaty Act to reduce and stabilize resident Canada goose populations. Management take would allow additional methods of taking resident Canada geese, allow shooting hours for resident Canada geese to extend to one-half hour after sunset, and remove daily bag limits for resident Canada geese. The intent of the program is to reduce resident Canada goose populations in order to protect personal property and agricultural crops, protect other interests from injury, resolve or prevent injury to people, property, agricultural crops, or other interests from resident Canada geese, and contribute to potential concerns about human health.

Like Alternative D, the management take component would be restricted to the States of Alabama,

Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Only State wildlife agencies and Tribal entities in these States could authorize the use of the additional hunting methods for resident Canada geese in the Atlantic, Central, and Mississippi Flyway portions of these States.

Under management take, the take of resident Canada geese outside the existing Migratory Bird Treaty frameworks for sport hunting seasons (i.e., 107 day limit from September 1 to March 10) would be authorized. The management take component would enable States to use hunters to harvest resident Canada geese, by way of shooting in a hunting manner, during the August 1 through August 31 period. States and Tribes would be required to designate participants operating under the conditions of the management take program and keep annual records of activities carried out under the authority of the program. The participating State or Tribe would also be required to submit an annual report summarizing activities conducted under the program.

States participating in the management take program component would be required to annually monitor the spring breeding population by providing an annual estimate of the breeding population and distribution of resident Canada geese in their State in order to assess population status.

We would annually assess the overall impact and effectiveness of the management take program on resident Canada goose populations to ensure compatibility with long-term conservation of the resource. If at any time evidence was presented that clearly demonstrated that resident Canada goose populations no longer needed to be reduced in order to allow resolution or prevention of injury to people, property, agricultural crops, or other interests, we would initiate action to suspend the program for the resident Canada goose population in question. However, resumption of growth by the population in question could warrant reinstatement of such regulations to control the population. Depending on the status of resident Canada goose populations, it is possible that a management take program could be in effect for one or more resident Canada goose populations, but not others. Suspension of regulations for a particular population would be made following a public review process.

In addition to the three main new components, we would continue the use of special and regular hunting seasons, issued under 50 CFR §20, and the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively.

7. Alternative G - General Depredation Order

This alternative would establish a general depredation order, allowing any authorized person (State wildlife agency personnel, airport managers, public health officials, agricultural landowners, operators, and tenants, private landowners and managers, or any other State authorized person or their agents) to conduct damage management activities on resident Canada goose populations either posing a threat to health and human safety or causing damage to personal or public property. The intent of this alternative would be to significantly reduce resident Canada goose populations in areas where conflicts are occurring.

Authorized management activities could include indirect and/or direct population control strategies such

as aggressive harassment, nest and egg destruction, gosling and adult trapping and culling programs, or other general population reduction strategies. Persons operating under this order would not be allowed to use decoys, taped calls, or other devices to lure birds. All management actions would have to occur on the premises of the problem area. The general depredation order would be for resident Canada goose populations only and, as such, in order to ensure protection of migrant Canada goose populations, could only be implemented between April 1 and August 31, except for the take of nests and eggs which would be additionally allowed in March.

Additionally, this alternative would include all components of Alternative D - Expanded Hunting Methods and Opportunities. This component would provide new regulatory options to State wildlife management agencies to potentially increase the harvest of resident Canada geese above that which results from existing special Canada goose seasons that target resident Canada geese.

In addition, we would continue the use of special and regular hunting seasons, issued under 50 CFR §20, and the issuance of depredation permits and special Canada goose permits, issued under 50 CFR §§21.41 and 21.26, respectively.

We would assess population status by monitoring annual spring breeding populations to provide for the long-term conservation of the resource. Additionally, all authorized persons (i.e., States and/or other applicable parties, such as airports or public health officials) would be required to annually report all management activities and take of resident Canada geese.

Under this alternative, unlike Alternative F - Integrated Damage Management and Population Control, the authorization for management activities, including the take of geese, would come directly from the Service via this depredation order and the authorized person or entity could implement the provisions of this alternative within the guidelines established by the Service. However, nothing in the Order would limit the individual States' ability to be more restrictive. Persons authorized by the Service under the Depredation Order would not need to obtain authority from the State unless required to do so under State law. Likewise, unless directed by the State, any authorized entity would not have to inform the State or report to the State concerning any management activities conducted. The State would not be responsible for any such Service authorized action taken by a person working under the authority of the general depredation order.

C. SUMMARY OF ACTIONS BY ALTERNATIVE

See **Table II-1**.

D. CHANGES TO DEIS ALTERNATIVES RESULTING FROM PUBLIC COMMENT

1. Administration and Organization of Proposed Action

To better relate the goals and objectives of the alternative, we have broken the proposed action into two main areas: depredation/damage/conflict management and population reduction/control. The depredation/damage/conflict management objective is addressed through the first component of the alternative - the various depredation orders contained in Alternative E - Control and Depredation Order Management. The population reduction/control objective is addressed through the other two main

components of the alternative - the increased hunting methods available in Alternative D - and the managed take component. We believe this reorganization makes the entire program better understood and administratively better organized.

2. Airport Control Order

First, we have taken the Airport Control Order contained in Alternative E out from under the State's direct control for implementation and made it a stand alone control order, i.e., under our direct control and supervision. The State would continue to have the legal ability to impose either further State restrictions on the program if they so wish or decline participation of airports in their State. As with all Federal regulations, the State may always be more restrictive. We believe the issues surrounding public safety at airports and military airfields warrant this administrative change. The State will not have to expend resources monitoring and administering this element of the program and the change further sets the stage for either adding additional species to the control order (should they be warranted) or doing an airport control order that encompasses all migratory bird species.

Second, we have added military airfields to the Airport Control Order. Military airfields are a significant component of the Nation's overall air traffic and warrant inclusion in any resident Canada goose airport control program.

3. Nests and Egg Depredation Order

Similar to the Airport Control Order, we have removed the Nest and Egg Depredation Order contained in Alternative E from under the State's direct control for implementation and made it a stand alone depredation order, i.e., under our direct control and supervision. The State would continue to have the legal ability to impose either further State restrictions on the program if they so wish or decline participation of private landowners and public land managers in their State. As with all Federal regulations, the State may always be more restrictive. We believe the large number of existing nest and egg permits, the minimal amount of environmental review currently being conducted, and the potential increased burden of placing the administration of this program with the State warrant this administrative change. The State will not have to expend resources reviewing, monitoring and administering this element of the program. Since significant numbers of comments both from the States and numerous nongovernmental organizations centered on the States having to assume control of this issue and possibly issue permits (see section **X. Public Comments and Service Response** for further details), our decision to make it a stand alone depredation order under our direct control should alleviate those concerns.

4. Public Health Control Order

Under the Public Health Control Order contained in Alternative E, the authority to conduct management and control activities was entrusted with the State, County, municipal, or local public health agency if the State decided to implement the Public Health Control Order component. We realize that most authorized management activities would not be conducted by the public health agency but would likely be conducted by either the State wildlife agency, Wildlife Services, or a private contractor. We have removed the public health agency as the primary implementing entity and have placed it with the State wildlife agency (or their agent) as long as the State, County, or local health agency recommends management action.

Further, resident Canada geese eligible for management actions must pose a direct threat to human health. A direct threat to human health is defined as one where a federal, state, or local public health agency recommends removal of resident Canada geese that the agency has determined pose a specific, immediate human health threat by creating conditions conducive to the transmission of human or zoonotic pathogens. Situations where resident Canada geese that were merely causing a nuisance would not be eligible.

5. Population Control/Reduction Components

With the administrative reorganization of the proposed alternative, the changes made to the control and depredation orders, and our reevaluation of the existing Special Canada Goose Permit (50 CFR 21.26), we have eliminated the State agency population control component within Alternative F - Integrated Damage Management and Population Control. Our reason in doing so was our belief that this component, outside of the management take component, was largely duplicative of already authorized management activities contained in the existing Special Canada Goose Permit.

Currently there are 18 States operating under the Special Canada Goose Permit (Colorado, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New York, North Dakota, Ohio, Oklahoma, South Dakota, Virginia, and Wyoming). The number of States operating under this permit has grown steadily since its inception in 1999. As recently as 2000, only five States were operating under the special permit (Michigan, Minnesota, Missouri, Ohio, and South Dakota) with no States in the Atlantic Flyway. The increased use of this permit, along with the largely duplicative aspects of the Special Canada Goose Permit with Alternative F's State population control component, confirm our belief this component should be eliminated.

We have, however, retained the management take component (formerly referred to in the DEIS as a conservation order) in Alternative F. While the management take component is dependent on implementation and regulation by the State, it is not solely a State-conducted management activity, like the State population control component was in the DEIS's Alternative F. Further, the management take component remains dependent on State surveys and will be the first component to be eliminated once the population reaches a level that its use is no longer necessary. We continue to believe that if a State desires to reduce their population via management take, it should be incumbent on them to provide additional population status information since this component is a more broad-based management action.

6. Pacific Flyway

We have largely dropped participation and applicability of States in the Pacific Flyway in the final EIS. The Pacific Flyway Council and Pacific Flyway States have consistently commented that they did not wish to participate in any new regulations and that they did not have the same resident Canada goose problems that the rest of the country, in particular the eastern and Great Lakes regions of the U.S., currently is experiencing (see section **X. Public Comments and Service Response** for further details). From a status information standpoint, evidence warranting inclusion in the proposed alternative was largely ambiguous in the Pacific Flyway, other than specific localized instances. The Pacific Flyway generally lacks good resident goose breeding and population surveys, numbers of geese are not as significant as other parts of the country, and the problems/issues/conflicts are more isolated and localized. Thus, we have dropped the States of the Pacific Flyway from all components except the Nest and Egg Depredation Order, the Public Health Control Order, and the Airport Control Order in

Alternative E - Control and Depredation Order Management. Based on comments, we believe the agricultural depredation issue in the Pacific Flyway is primarily a migrant goose issue, not a resident goose issue.

7. Management Take in September

Traditionally, we have used special Canada goose seasons in September to target resident goose populations and address some of the conflicts and problems caused by overabundant resident Canada geese. The primary issue with extending a management take type action into September is that we know some migrant geese in some areas will be taken. In particular, areas in the upper midwest (Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, and Montana) would have some level of migrant geese taken. Our information is based on studies these States conducted on their existing September special Canada goose seasons. However, we note that all areas in question fall within the existing special September Canada goose season criteria of less than 10 percent migrant geese. Since the management take component, as is the entire scope of the EIS, is specifically directed at resident Canada geese, we cannot reliably extend this component into September.

8. Tribal Entities

Beginning with the 1985-86 hunting season, we have employed guidelines to establish special migratory game bird hunting regulations on Federal Indian reservations (including off-reservation trust lands) and ceded lands (Federal Register 1985). These guidelines were developed in response to tribal requests for recognition of their reserved hunting rights, and for some tribes, recognition of their authority to regulate hunting by both tribal and nontribal members throughout their reservations. The guidelines apply to those Tribes having recognized reserved hunting rights on Federal Indian reservations (including off-reservation trust lands) and on ceded lands. They also apply to establishing migratory bird hunting regulations for nontribal members on all lands within the exterior boundaries of reservations where Tribes have full wildlife management authority over such hunting or where the Tribes and affected States otherwise have reached agreement over hunting by nontribal members on lands owned by non-Indians within the reservation. Because of the ongoing relationship we enjoy with the participating tribes (approximately 30 annually), and their full wildlife management authority on tribal lands, we have decided to include their participation in several of the alternatives or parts of alternatives. More specifically, tribal eligibility under Alternative D and the management take component of Alternative F is included in this FEIS. Currently, there are approximately 13 tribes participating in the Atlantic, Mississippi, and Central Flyways (Federal Register 2003b and 2003c).

E. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

There were a number of alternatives identified from the public scoping process and from comments received on the DEIS that we considered but eliminated from further analysis. The following recommendations were considered but rejected because they did not have the capacity to address our responsibilities, and did not possess the potential to alleviate problems associated with large numbers of resident Canada goose populations. Many of the recommendations we received involved minor modification of existing migratory bird hunting regulations that would not significantly increase harvest. We chose not to analyze such alternatives because they would create unnecessary confusion to citizens concerning regulations without significantly decreasing resident Canada goose abundance.

1. Use of Reproductive Inhibitors

A number of commenters suggested the use of birth control as a feasible and humane alternative. While sterilization by either surgical neutering or oral contraception are both conceptually very attractive, both methods have serious drawbacks. Surgical sterilization of male Canada geese (vasectomy) has been shown to be an effective means of reducing reproduction. However, the need for experienced field staff, the associated high labor costs, and the fact that males must be caught, identified, and treated greatly lessens most consideration for this method (Converse and Kennelly 1994; Keefe 1996). Similarly, oral contraception is not yet commercially available for Canada geese (Allan et al. 1995; Hill and Craven 2000). However, research on new experimental drugs that inhibit bird reproduction is currently being conducted by the USDA National Wildlife Research Center and other research institutions. Although some initial results on some compounds appear promising, much work remains on dosage levels, delivery systems, environmental effects, and long-term impacts. Further, even if reproduction could be prevented, existing goose populations would remain high for many years due to the long life span of adult birds.

2. Permit the Use of Lead Shot

It was suggested that liberalizing certain waterfowl hunting regulations to increase the harvest of resident Canada geese should include the option for hunters to use lead shot. In the United States, the use of lead shot for waterfowl and coot hunting was banned nationwide beginning with the 1991-92 season as a result of a recommendation by the International Association of Fish and Wildlife Agencies (IAFWA). The IAFWA recommendation resulted in large part from the high probability of prolonged litigation and a Federal District Court order to the Secretary of Interior to either prohibit the use of lead shot for hunting waterfowl or discontinue opening waterfowl hunting seasons, based principally on a finding of violation of the Endangered Species Act (16 U.S.C. 1538 et seq.). The Court found that ingestion by bald eagles of body tissue containing embedded lead from hunter-crippled birds was found to be adversely affecting recovery of these endangered birds, which opportunistically feed on dead and dying waterfowl in migration and wintering areas. The Court also considered the numerous research findings by State, Federal, university and private investigators on the broader effects of lead-shot use by waterfowl hunters. These findings indicated that spent lead shot from waterfowl hunting was resulting in the loss from lead poisoning of 2 to 3 percent of the fall flight, or as many as 1 to 4 million waterfowl annually. Spent lead shot from the most current hunting season, as well as that accumulating in soils and other substrate over longer periods, has been found to produce lead toxicosis in waterfowl and other migratory birds when ingested. Lead toxicosis, or lead poisoning, makes birds more vulnerable to hunter harvest and other predation, and it often has more acute mortality effects. The Court order was also based upon the fact that waterfowl hunters had available to them an effective, alternative nontoxic shot in steel. Since the advent of the nationwide lead shot ban, other alternative shot types have been approved for waterfowl hunters, e.g. bismuth-tin. Most waterfowl hunters now understand and support the need to use nontoxic shot and have adjusted well to the use of an alternative for lead.

In summary, we consider the use of lead shot for resident Canada geese unacceptable because: (1) the use of nontoxic shot is the only waterfowl and other migratory bird stewardship option open to the Secretary of the Interior if annual hunting seasons are to be sustained; (2) the promotion of the use of lead shot would only re-open an unnecessary and unproductive debate about the toxic effects of lead on birds and the crippling loss associated with steel; (3) the negative affects of lead shot on the health and welfare of not only the target species but other wildlife as well - possibly including endangered and/or threatened species; (4) the level of crippling in the past with lead shot has been shown to be every bit as high as it

has been with steel shot (Anderson and Roetker 1978, Anderson and Sanderson 1979, Humburg et. al 1982, and Brownlee et al. 1985); and (5) the list of alternative shot types is growing for the waterfowl hunter who does not want to use steel or bismuth-tin, and the hunter may now select from at least eight types that approved for use in waterfowl hunting (50 CFR 20.21(j)) with several others being considered for approval (Federal Register 2004).

3. Removal from the Migratory Bird Treaty

Canada geese are protected under the Migratory Bird Treaty Act of 1918 (as amended), which implements International migratory bird treaties with Great Britain (for Canada), the United Mexican States, Japan, and the Soviet Union. As such, the treaties expressly protect any migratory bird included in the terms of the various Conventions. All Canada geese are afforded such protection. To remove Canada geese from the protected list of migratory birds, or to reclassify resident Canada geese, would not only be contrary to the intent and purpose of the original treaties, but would require amendment of the original treaties - a lengthy process requiring approval of the U.S. Senate and President and subsequent amendments to each treaty by each signatory country. Thus, we believe this approach is neither likely nor in the best interest of the migratory bird resource.

4. Commercial Use of Birds

The Migratory Bird Treaty Act of 1918 (as amended) specifically prohibits the “offer to sale, sell, offer to barter, barter, offer to purchase, purchase, “of any migratory bird, part, nest, or egg, unless and except as permitted by regulations. Furthermore, Article II of the Migratory Bird Treaty between the United States and Canada specifically prohibits the sale or offer for sale of migratory birds, their nests, or eggs, except in the case of Aboriginal peoples of Canada. Changes to the Migratory Bird Treaty would entail time-consuming negotiations between the U.S. and Canadian Federal governments, with uncertain results. Many resident Canada goose populations would continue to increase during the negotiation period, thus making control more difficult if and when expanded commercial harvesting is eventually authorized. Therefore, we have chosen not to analyze this alternative.

5. Increased Research

For the past 20 years, the Service and Wildlife Services have actively supported research on resident Canada geese. Our present knowledge of the basic ecological, biological, and population status information on resident Canada geese has been possible because of the long-standing work and commitment of State, Federal, and private researchers. However, we do not believe that research is a stand-alone alternative, but rather should be a continuing, integral part of any viable alternative. It is only by both application and research that we will increase our understanding and ultimately better manage the resource.

6. Implement Land-Use Restrictions

The Service and Wildlife Services have no authority or jurisdiction over State, local, or private land use. Any land-use restrictions affecting resident Canada geese would require either State or local ordinances to that effect. Federal land management is normally based on land-use plans that are cooperatively developed through a public process that attempts to balance competing uses and benefits. We believe that it is highly unlikely that such restrictions, either at the Federal, State, or local level, would contribute

significantly to solving goose conflicts.

7. Increase Natural Predators

Adult Canada geese have very few natural predators. In fact, Sargeant and Raveling (1992) found that adult geese do not commonly fall prey to predators. Most predation of resident Canada geese, like most other goose species, occurs on eggs and goslings. Hanson (1997) speculated that the chief mammalian predator of giant Canada geese was coyote (*Canis latrans*) in the far west and Great Plains and red fox (*Vulpes fulva*) in the east and northeast. Naylor (1953), in a study of the western Canada goose (*Branta canadensis moffitti*), cited the coyote and striped skunk (*Mephitis mephitis*) as the chief mammalian predators of nests, and the black-billed magpie (*Pica pica*), crow (*Corvus branchyrhynchos*), ring-billed gull (*Larus delawarensis*), and California gull (*Larus californicus*) as the principal avian predators. Geis (1956) determined that over 90 percent of nest destruction in the Flathead Valley in Montana was due to crows and ravens (*Corvus corax*). However, Hanson (1997) speculated that the giant Canada goose, because of its superior size and strength, can be presumed to have an advantage over smaller Canada goose subspecies against predatory enemies. In an urban goose population, Conover (1998) found that raccoons (*Procyon lotor*), red foxes, and crows were responsible for most nest predation.

In recent years, participation in traditional furbearer trapping has declined, particularly in suburban and urban areas. This decline, coupled with human population growth and the resulting fragmentation and loss of wildlife habitat from land development, and the fact that species such as raccoons, coyotes, and foxes are highly adaptable to urban and suburban environments, has resulted in the growth of animal control businesses (Northeast Furbearer Resources Technical Committee 1996). Animal control activities indicate that urban and suburban predators are probably at all-time high population levels in many areas. Given that resident goose populations have also dramatically increased in recent years and continue to exhibit steady growth rates (U.S. Fish and Wildlife Service, 2000), we believe that predator populations are not limiting growth of resident goose populations, especially in urban and suburban environments. Additionally, rarely in wildlife management is the introduction or reintroduction of additional predators either a feasible, biologically responsible, or a publicly palatable alternative, to solve the conflicts caused by overpopulation of another species.

8. Compensation for Damages

A 1997 survey found that 19 States and 7 Provinces had damage compensation programs (Wagner et al. 1997). However, of these, only three States and three Provinces provided compensation for damage by waterfowl, and only Wyoming and Wisconsin covered bird damage to property other than cultivated crops (Wagner et al. 1997). Additionally, most programs had restrictions and limitations on benefit eligibility, such as thresholds for damage, requiring public access for hunting, and requiring producers to meet certain requirements prior to compensation.

Damage to agricultural crops and private and public property resulting from resident Canada geese has been conservatively estimated at more than \$8.5 million annually (Division of Migratory Bird Management 2000). During 1997-99, Wisconsin provided \$133,166 in Canada goose damage compensation, an average of \$44,388 per year. However, of this total, only \$84,978 (an average of \$28,326 per year) could be attributed to damage from resident Canada geese (Sarah Carter, Wisconsin Department of Natural Resources, personal communication). Further, Rollins and Bishop (1998) reported that Wisconsin's program had been only partially successful in relieving tensions between

farmers and wildlife management.

The Service's entire FY2000 budget for migratory bird management was \$21.6 million. Given the potential amount of claim requests and the costly administration and oversight for such a program, the Service does not have the financial resources to compensate landowners and property owners for damages resulting from resident Canada geese. Further, the Service has never provided compensation for any wildlife-related damage and to do so would most likely require Congressional authority.

9. Discontinue Wildlife Management Practices

Some commenters suggested that wildlife management agencies, including the Service, should discontinue any wildlife management practice that benefits resident Canada geese, especially in those areas where resident goose populations have reached conflicting levels. Such practices would include wildlife food plots, pond and wetland construction and management, wetland restoration, and migratory bird refuges. While we agree that wildlife management practices should be evaluated by agencies before implementation to determine their impact on local Canada geese, most wildlife management practices benefitting resident Canada geese (either purposefully or ancillary) provide benefits for many other migratory bird species and resident wildlife. To discontinue or dissuade these important wildlife management practices or wetland restorations would be contrary to the Service's mission and responsibilities and would be environmentally irresponsible. However, there are a number of things wildlife agencies and other land use planners can do to make both existing and planned wildlife areas less attractive to resident Canada geese. These techniques are discussed under section **II. A. Description of Goose Management Techniques**.

10. Allow Baiting

The use of bait to lure and hunt migratory birds was prohibited in 1935 because of its effectiveness in aiding the harvest of migratory birds. Since their establishment, baiting regulations have been a focal point of many regulatory, ethical, and conservation-oriented discussions. Amendments to baiting regulations have occurred relatively infrequently since the 1940s. However, in 1999, the migratory bird baiting regulations were revised to clarify the current regulations and to provide a framework for sound habitat management, normal agricultural activities, and other management practices as they relate to lawful migratory game bird hunting (Federal Register 1999a).

Baiting for Canada geese, as defined in 50 CFR §20.21(i), likely would enhance the ability to harvest resident Canada geese in some situations and contribute to efforts to reduce the population. However, we believe that the widespread use of bait to take resident Canada geese would lead to confusion and frustration on the part of the public, hunters, wildlife-management agencies, and law enforcement officials due to the inherent difficulties of different sets of baiting regulations for different species. Currently, the baiting regulations differentiate between waterfowl species and other migratory game birds, such as doves and pigeons. Some management practices allowed for the hunting of doves are not allowed for the hunting of waterfowl. To complicate this current difference with a further division between resident Canada geese and other waterfowl would only serve to further complicate the regulations.

11. Springtime Hunting

During the spring (March - May), there are numerous temporal and geographic overlaps between the various Canada goose populations. Because the status of each population varies widely, and because any management action for resident Canada geese must be legally targeted at only resident Canada geese, we see no feasible way to consider springtime hunting or control of resident Canada geese using hunters during this time period.

Table II-1. Comparison of actions by alternative.

<u>Action</u>	<u>Alternative A</u> No Action	<u>Alternative B</u> Nonlethal Control & Management (Non-permitted Activities)	<u>Alternative C</u> Nonlethal Control & Management (Permitted Activities)	<u>Alternative D</u> Expanded Hunting Methods and Opportunities	<u>Alternative E</u>				<u>Alternative F</u> Integrated Damage Mgmt. and Population Control	<u>Alternative G</u> General Depredation Order
					Airport Control Order	Nest and Egg Depredation Order	Agricultural Depredation Order	Public Health Control Order		
Targeted public	General	General	General	Hunters	Airports and Military airfields	Landowners and public land managers	Agricultural Producers	Public health sites	General, hunters, and specific sites	General, hunters, and specific sites
New regulatory strategies	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continued issuance of depredation permits	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continued issuance of special Canada goose permits	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Continue special hunting seasons	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expansion of hunting methods	No	No	No	Yes	No	No	No	No	Yes (Alt. D)	Yes
Managed Take (Conservation-type season)	No	No	No	No	No	No	No	No	Yes	No
Increased Service staffing and/or funding	No	Yes	Yes	No	No	Yes	No	No	Yes	No
Increased Service promotion of non-lethal management	No	Yes	Yes	No	No	No	No	No	No	No
Allows take of nests and eggs	Yes - with permit	No	Yes - with permit	Yes - with permit	Yes - with permit or under Control Order at airports	Yes - without permit if private landowner or public land manager	Yes - with permit or under Depredation Order at ag sites	Yes - with permit or under Control Order at health sites	Yes - with permit or without under various orders (Alt. E)	Yes - without permit
Allows take of adults and goslings	Yes - with permit	No	No	Yes - with permit	Yes - with permit or under Control Order at airports	Yes - with permit	Yes - with permit or under Depredation Order at ag sites	Yes - with permit or under Control Order at health sites	Yes - with permit or without under various orders	Yes - without permit
Management activities must occur on conflict premises	Depends on permit	No	No	No	No - with permit Yes - under Control Order at airports	No - with permit Yes - under Depredation Order	No - with permit Yes - under Depredation Order at ag sites	No - with permit Yes - under Control Order at health sites	No - with permit Yes - under various orders	Yes
Require new monitoring and evaluation	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes